ICSE · CLASS 10 · MATHEMATICS

ICSE Class 10 Mathematics Guess Paper 2027

Time: 3 hours · Maximum marks: 80 · 33 questions

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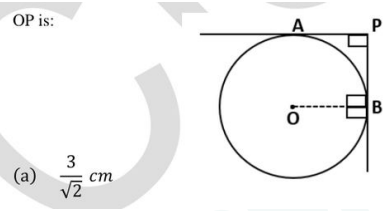
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Section A

Compulsory. Q1 is fifteen multiple-choice questions (1 mark each, including assertion-reason items). Q2 and Q3 are structured problems: five 4-mark parts and one 5-mark part covering commercial maths, algebra, mensuration, coordinate geometry, circles and reflection.

Q1. (x + 2) and (x + 3) are the factors of $x^3 + 4x^2 + x - 6$. The third factor of the given polynomial is: (a) (x - 1) (b) (x - 4) (c) (x + 1) (d) (x + 4) — 1 mark

Q2. In the given diagram, the radius of the circle with centre O is 3 cm. PA and PB are the tangents to the circle which are at right angle to each other. The length of OP is: (a) 3/sqrt(2) cm (b) 3 cm (c) 3sqrt(2) cm (d) 6sqrt(2) cm — 1 mark

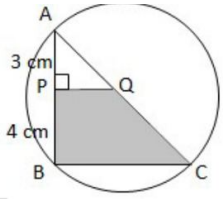


Q3. Assertion (A): If sec theta + tan theta = a and sec theta - tan theta = b, then ab = 1. Reason (R): $\sec^2$ theta - $\tan^2$ theta = 1. (a) A is true and R is false. (b) A is false and R is true. (c) Both A and R are true, and R is the correct explanation for A. (d) Both A and R are true, but R is not the correct explanation for A. — 1 mark

Q4. Given two matrices A and B, where A = [-1 2] and B = [[3],[4]] then product AB is: (a) [[-3],[8]] (b) 5 (c) [5] (d) [-3 8] — 1 mark

Q5. Radha deposited `400 per month in a recurring deposit account for 18 months. The qualifying sum of money for the calculation of interest is: (a) `3,600 (b) `7,200 (c) `68,400 (d) `1,36,800 — 1 mark

Q6. In the figure given below, AC is a diameter of the circle. AP = 3 cm and PB = 4 cm and QP perpendicular to AB. If the area of triangle APQ is 18 cm^2, then the area of shaded portion QPBC is: (a) 32 cm^2 (b) 49 cm^2 (c) 80 cm^2 (d) 98 cm^2 — 1 mark



Q7. Given that the sum of the squares of the first seven natural numbers is 140, then their mean is: (a) 20 (b) 70 (c) 280 (d) 980 — 1 mark

Q8. A bag contains 3 red and 2 blue marbles. A marble is drawn at random. The probability of drawing a black marble is: (a) 0 (b) 1/5 (c) 2/5 (d) 3/5 — 1 mark

Q9. A mixture of paint is prepared by mixing 2 parts of red pigments with 5 parts of the base. Using the given information in the following table, find the values of a, b and c to get the required mixture of paint. Parts of red pigment: 2, 4, b, 6; Parts of base: 5, a, 12.5, c. (a) a=10, b=10, c=10 (b) a=5, b=2, c=5 (c) a=10, b=5, c=10 (d) a=10, b=5, c=15 — 1 mark

Q10. An article which is marked at `1,200 is available at a discount of 20% and the rate of GST is 18%. The amount of SGST is: (a) `216.00 (b) `172.80 (c) `108.00 (d) `86.40 — 1 mark

Q11. The sum of money required to buy 50, `40 shares at `38.50 is: (a) `1,920 (b) `1,924 (c) `1,925 (d) `1,952 — 1 mark

Q12. The roots of quadratic equation $x^2 - 1 = 0$ are: (a) 0, 0 (b) 1, 1 (c) -1, -1 (d) +1, -1 — 1 mark

Q13. Which of the following equations represents a line equally inclined to the axes? (a) 2x - 3y + 7 = 0 (b) x - y = 7 (c) x = 7 (d) y = -7 — 1 mark

Q14. Given, x + 2 <= x/3 + 3 and x is a prime number. The solution set for x is: (a) empty set (b) {0} (c) {1} (d) {0, 1} — 1 mark

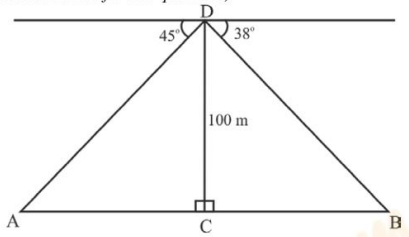
Q15. The nature of roots of quadratic equation $3x^2 - 6x - 3 = 0$ are: (a) real and equal (b) real, distinct and rational (c) real, distinct and irrational (d) no real roots — 1 mark

Q16. Prove the following trigonometric identity: $(\cos^2 \text{theta})/(1 - \tan \text{theta}) + (\sin^2 \text{theta})/(1 - \cot \text{theta}) = 1 + \cos \text{theta} \sin \text{theta}$ — 4 marks

Q17. Using step-deviation method, find mean for the following frequency distribution. Class: 0-15 (3), 15-30 (4), 30-45 (7), 45-60 (6), 60-75 (8), 75-90 (2). — 4 marks

Q18. From the top of a tower 100 m high a man observes the angles of depression of two ships A and B, on opposite sides of the tower as 45 and 38 respectively. If the foot of the tower and the ships are in the same horizontal line find the distance between the two ships A and B to the nearest metre. (Use Mathematical Tables for this question.) — 4 marks

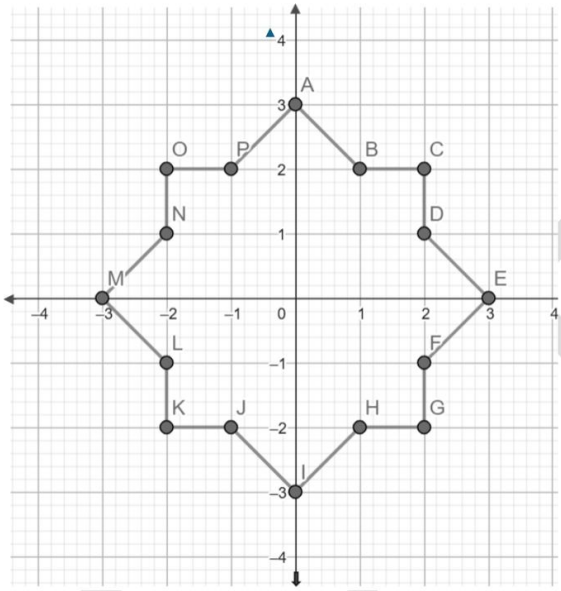
(Use Mathematical Tables for this question.)



Q19. Solve the quadratic equation $(x - 2)^2 + 11x - 7 = 0$ and give your answer correct to 3 significant figures. — 4 marks

Q20. While factorizing a given polynomial, using remainder and factor theorem, a student finds that $(2x + 1)$ is a factor of $2x^3 + 7x^2 + 2x - 3$. (a) Is the student's solution correct stating that $(2x + 1)$ is a factor of the given polynomial? (b) Give a valid reason for your answer. Also, factorize the given polynomial completely. 4 marks

Q21. Study the graph and answer the given questions: (a) Write down the coordinates of A, B, C, D and E. (b) Write down the image of A under reflection on the y-axis. (c) Name the point, with its coordinates, which is the image of C under reflection through the origin. (d) What is the image of the polygon ABCDEFGHI when reflected on the y-axis? (e) Write down the equation of the line joining the points N and D. 5 marks



(a) Write down the coordinates of A, B, C, D and E

Section B

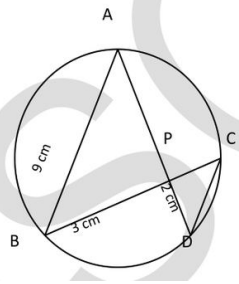
Attempt any four of the seven questions; each question is 10 marks built from sub-parts (typically 3+3+4, one question 5+5). Modelled as the marks a candidate writes across the four attempted questions: eight 3-mark parts and four 4-mark parts.

Q22. Solve the following inequation, write the solution set and represent it on the real number line. $-6 + 12x/5 <= 7x/5 - 3 < 2/5 + 2x$, x in R. 3 marks

Q23. Ms. Kaur invested `8000 in buying `100 shares of a company paying 6% dividend at `80. After a year, she sold these shares at `75 each and invested the proceeds including the dividend received during the first year in buying `20 shares paying 15% dividend at `27 each. Find the: (a) dividend received by her during the first year. (b) number of shares she purchased using the total proceeds including the dividend. 3 marks

Q24. Using Remainder and Factor Theorem, factorise the following polynomial: $2x^3 + 5x^2 - 28x - 15$. 3 marks

Q25. In the given figure (not drawn to scale) chords AD and BC intersect at P, where AB = 9 cm, PB = 3 cm and PD = 2 cm. (a) Prove that triangle APB ~ triangle CPD. (b) Find the length of CD. (c) Find area triangle APB : area triangle CPD. 3 marks



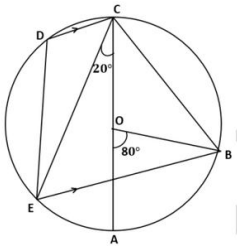
Q26. Mr. Sam has a recurring deposit account and deposits `600 per month for 2 years. If he gets `15,600 at the time of maturity, find the rate of interest earned by him. 3 marks

Q27. The following bill shows the GST rate and the marked price of articles: Vidhyut Electronics: (a) LED TV set marked price `12000 quantity 01 rate of GST 28%; (b) MP4 player marked price `5000 quantity 01 rate of GST 18%. Find the total amount to be paid (including GST) for the above bill. 3 marks

Q28. The following letters A, D, M, N, O, S, U, Y of the English alphabet are written on separate cards and put in a box. The cards are well shuffled and one card is drawn at random. What is the probability that the card drawn is a letter of the word, (a) MONDAY? (b) which does not appear in MONDAY? (c) which appears both in SUNDAY and MONDAY? 3 marks

Q29. A man opened a recurring deposit account in a bank. He deposits `1000 per month for 2 years. The matured value is equal to 26 times the amount he pays per month. Find the: (a) interest paid by the bank. (b) rate of interest per annum that the bank was paying for the recurring deposit account. 3 marks

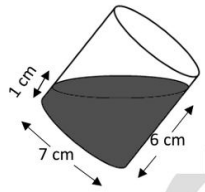
Q30. In the given figure, AC is the diameter of the circle with centre O. CD is parallel to BE. angle AOB = 80 and angle ACE = 20. Calculate: (a) angle BEC (b) angle BCD (c) angle CED 4 marks



[Analysis & Evaluation]

Q31. In the diagram given below, a tilted right circular cylindrical vessel with base diameter 7 cm contains a liquid. When placed vertically, the height of the liquid in the vessel is the mean of two heights shown in the diagram (7 cm and 6 cm). Find the area of wet surface, when the cylinder is placed vertically on a horizontal surface. (Use pi = 22/7). 4 marks

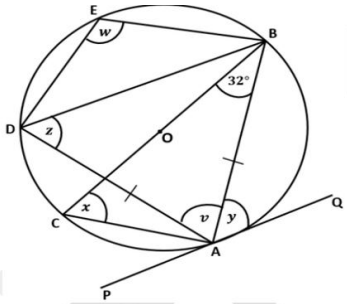
(Use $\pi = \frac{22}{7}$).



[Application & Evaluation]

Q32. A manufacturing company prepares spherical ball bearings, each of radius 7 mm and mass 4 gm. These ball bearings are packed into boxes. Each box can have a maximum of 2156 cm^3 of ball bearings. Find the: (a) maximum number of ball bearings that each box can have. (b) mass of each box of ball bearings in kg. (Use pi = 22/7) 4 marks

Q33. In the given figure, O is the centre of the circle and AD = AB. If angle ABC = 32, find the angles x, y, z, v and w. 4 marks



[Application, Analysis & Evaluation]

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